

# Smallpox Immunization Information Management System

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## One State Approach (Kansas)

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# Background

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✠ December 2002

- CDC announces development of centralized I.S. (PVS)
- Available to all states for free
- Secure online access
- System to be deployed in time for pre-event immunizations
- States allowed to use state-based systems
  - Need to be certified
  - Must upload records to PVS using XML schema

## *The Dilemma - Should we use the CDC PVS system?*

<b>PROS</b>	
Cheap	
Standardization assured	
Burden of development and maintenance on CDC	

## *The Dilemma - Should we use the CDC PVS system?*

PROS	CONS
Cheap	Online only
Standardization assured	Secure Digital Certificate required
Burden of development and maintenance on CDC	Concerns about patients' identifiable information
	Concerns about not retaining full control of our records
	No integrated adverse reactions surveillance information system
	Training on newly developed system
	History of late delivery of CDC centralized Information Systems

# Current Information Systems for Epidemiology in Kansas

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## ✧ HAWK (1999)

- ✧ Electronic disease reporting system
- ✧ Secure, online access
  - MS SQL database
- ✧ Used by local health departments and KDHE staff for reportable diseases (including TB and vaccine-preventable)

## ✧ PHIX (Public Health Information Exchange, 2002)

- ✧ Alert, notification

## ✧ Immunization registry

- ✧ Currently not very functional
- ✧ New Web-based system under development

# The Decision: Kansas Smallpox Patient Vaccination System

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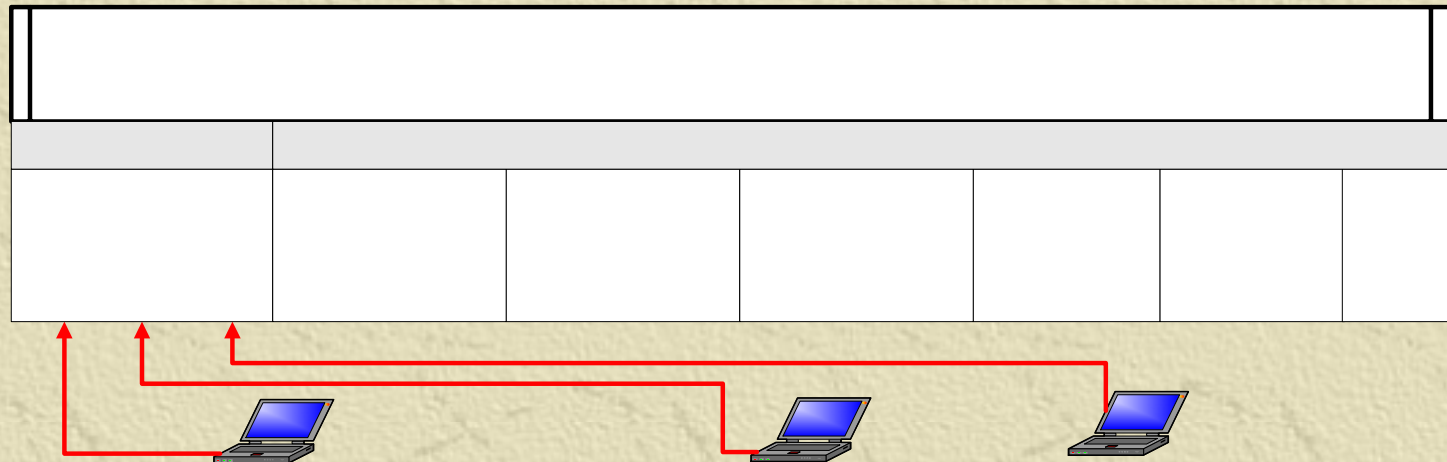
## ✧ Built around HAWK architecture

- Secure online access
- Solid, well tested MS SQL database
- KDHE and LHD's users already familiar

## ✧ Includes:

- Offline (“disconnected”) data entry application
- Main MS SQL database
- Data import function from disconnected application to main database
- Online access to main database
- Data export (XML) to CDC

# Kansas Patient Vaccination System Architecture



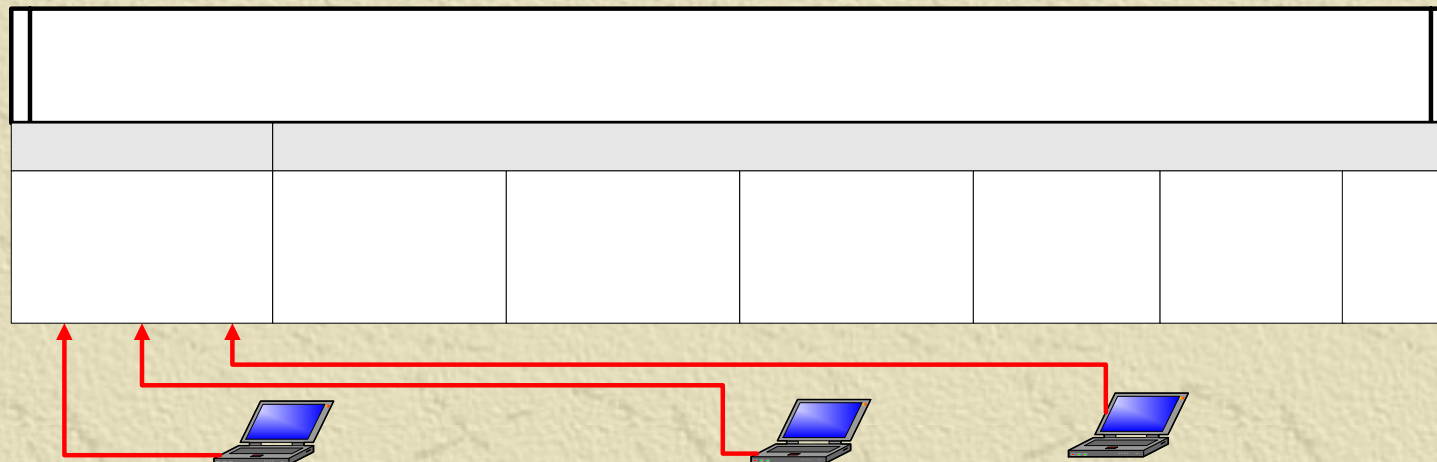
# Kansas SPVS – 1) Disconnect Application

✦ Enable offline data entry for **NEW RECORDS**

✦ MS Access database copied onto 4 individual laptops

✦ Functions:

- ✦ Generate records on clinic, vaccine batch, vaccinators, medical screeners (ADMIN FUNCTIONS)
- ✦ Generate new patient, vaccination record
- ✦ Export records to MS SQL central database



# Disconnect Application – Main Menu



## Smallpox Vaccination Main Menu

**Enter Patient / Vaccination Information**

KDHE Only

**Patient / Vaccination Update**

**Set Clinic Default**

**Export Data**

**Add Vaccine Batch**

**Add Vaccinators**

**Add Medical Screeners**

**Exit**

# Disconnect Appl – Patient and Vaccination record

File Edit View Insert Format Records Tools Window Help

Times New Roman 12 B I U

Patient Vaccination Number (from sticker)

**SECTION A: PATIENT DEMOGRAPHIC INFORMATION**

First Name  Middle Name

Last Name  Suffix

Street Address  Apt. #

City  State  Zip Code

County

**Contact Information:**

Home Phone  Work  ext.

Occupation

Date of Birth  Gender

Ethnicity

Race (Check all that apply): ☐ African American ☐ American Indian or Alaskan ☐ Asian  
☐ Hawaiian ☐ White

**SECTION B: VACCINATION AND MEDICAL HISTORY**

**Vaccination History**

Did you ever receive the smallpox vaccine?

Previous Vaccination Date (document recall only)

Previous Vaccination Scar? ☐ Yes ☐ No or Don't Know

Previous Vaccination Adverse Events? ☐ Yes ☐ No or Don't Know

If yes, describe reaction

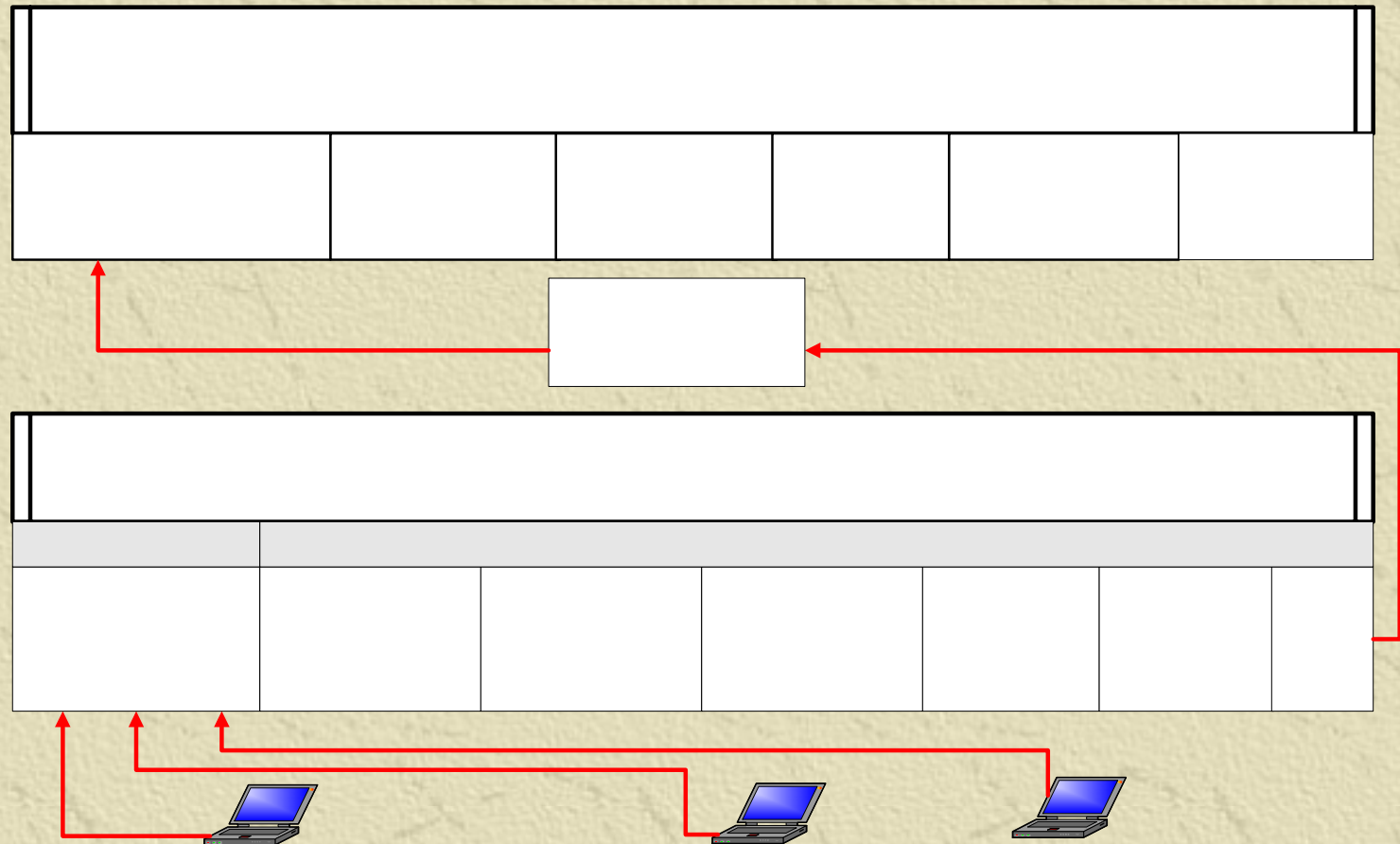
**Medical History**

Have you received chickenpox (varicella) vaccination in the last month? ☐ Yes ☐ No

Are you currently taking medications? ☐ Yes ☐ No

If yes, list medications

# Kansas Patient Vaccination System Architecture

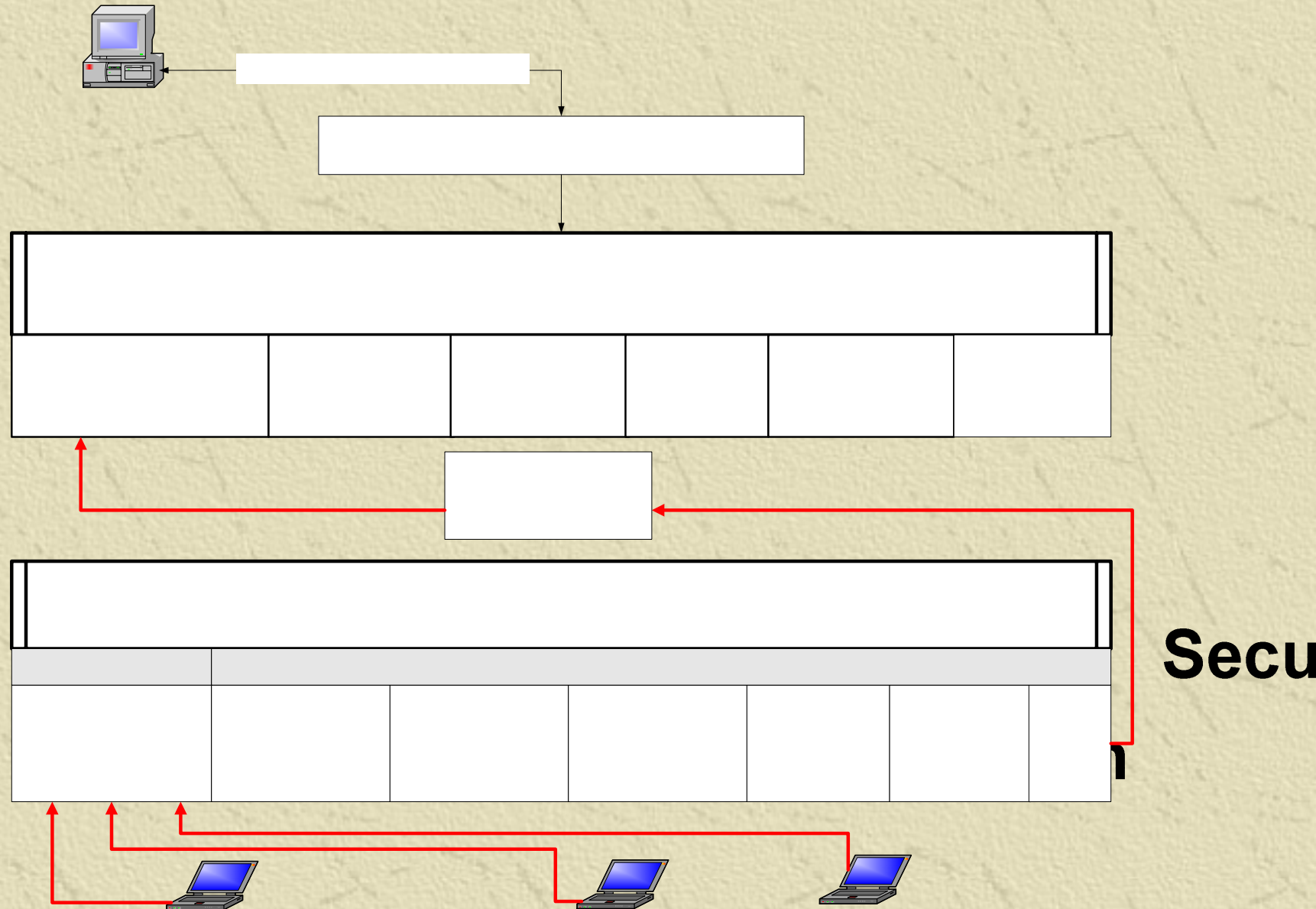


# Kansas SPVS – Import function

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- ✧ Moves records from MS ACCESS databases to one central MS SQL database
- ✧ Used at the end of each clinic day
- ✧ **One-way, one-time process:**
  - ✧ ACCESS replaces existing record with same PVN
    - No record updates possible through this system
  - ✧ No information transfer from SQL to Access

# Kansas Patient Vaccination System Architecture



# Kansas SPVS – 2) Online Application

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- ✠ Based on MS SQL database
- ✠ Uses same HAWK architecture, views
- ✠ Receives input from :
  - Disconnect Application (new records)
  - Online users
    - Take response
    - Reports
  - Active Surveillance records
    - Entered **through** Access interface
    - Part of MS SQL central database

# Online Application – Main Menu

Smallpox Vaccination - Microsoft Internet Explorer

[Vaccination](#)[Change Password](#)[Administrator Menu](#)[Reports](#)[Exit](#)[Take Response](#)

## KANSAS SMALLPOX VACCINE SITE

**\*\*KDHE's mission is to optimize the promotion  
and protection of the health of Kansans through efficient and effective  
public health programs and services and through preservation, protection,  
and remediation of natural resources of the environment. \*\***



# Online Application – Record Location

ation Search - Microsoft Internet Explorer

## Smallpox Vaccine

### Add/Update

Last Name:

First Name:

PVN:

[Search](#)

[Main Menu](#)

# Online Application – Record Location

nation Report - Microsoft Internet Explorer

[Back](#)[MainMenu](#)[Exit](#)

## Individuals that match your criteria

[Add Patient](#)

Initial PVN	Name	Birthday	County Residence
1003896086	Pezzino, Gianfranco	6/12/1954	SHAWNEE

[View](#)

# Online Application – Patient Information

Info - Microsoft Internet Explorer

[Back](#)[Smallpox Vaccination](#)[MainMenu](#)[Exit](#)

## PATIENT INFORMATION AND MEDICAL HISTORY

### SECTION A: PATIENT DEMOGRAPHIC INFORMATION

Initial PVN

#### Name Information

First  Middle

Last  Suffix

Occupation

Day Phone  ext.

Evening Phone

#### Latest Address Information

Address1  Address2

City

Zip Code  State

County

#### Race/Sex/Age Information

Race(Check all that apply):

☐ American Indian or Alaska Native

☐ Black or African American

☐ Asian

☒ White

# Online Application – Vaccine Information

Report - Microsoft Internet Explorer

[Back](#)[MainMenu](#)[Exit](#)

## Smallpox Vaccination List

Last Name: Pezzino

First Name: Gianfranco

Initial PVN: 1003896086

Birth Date: 6/12/1954

<a href="#">Add Vaccination</a>	PVN	Name	Date Of Vaccination	County Residence
<a href="#">Edit/View</a>	1003896086	Pezzino, Gianfranco	2/7/2003	SHAWNEE

# Online Application – Vaccine Information

ination - Microsoft Internet Explorer

[Patient Info](#)[Vaccine List](#)[Take Response](#)[Adverse Reactions](#)[MainMenu](#)

## SmallPox Vaccine

**Last Name: Pezzino**  
**First Name: Gianfranco**  
**Initial PVN: 1003896086**  
**Birth Date: 6/12/1954**

### SECTION C: CURRENT VACCINATION INFORMATION

#### Referring Organization

Organization Name

Kansas Department of Health and Environment

#### Clinic Information

Clinic

Topeka Vaccination Clinic

#### Vaccination Information

PVN

1003896086

DISPOSITION

Vaccinated

Vaccine Date

02/07/2003

Vaccine Batch Number

1

Arm Inoculated

Left

#### Vaccine Administered By

Vaccinator Name

Sue Bowden

[Update](#)[Delete](#)[Cancel](#)

# Online Application – Take Response

ccination - Microsoft Internet Explorer

[Patient Info](#)[Current Vaccine](#)[Vaccine List](#)[Adverse Reactions](#)[MainMenu](#)

## SmallPox Vaccine Take Response

**Last Name: Pezzino**  
**First Name: Gianfranco**  
**Initial PVN: 1003896086**  
**Birth Date: 6/12/1954**

### Smallpox Vaccination

#### Take Response Clinic Information

Name

Exam Date

Take Status

#### Take Response Exam performed by:

First  Middle   
Last  Professional Suffix

[Update](#)[Delete](#)[Cancel](#)

# Online Application – Reports

Reports - Microsoft Internet Explorer

## SmallPox Reports

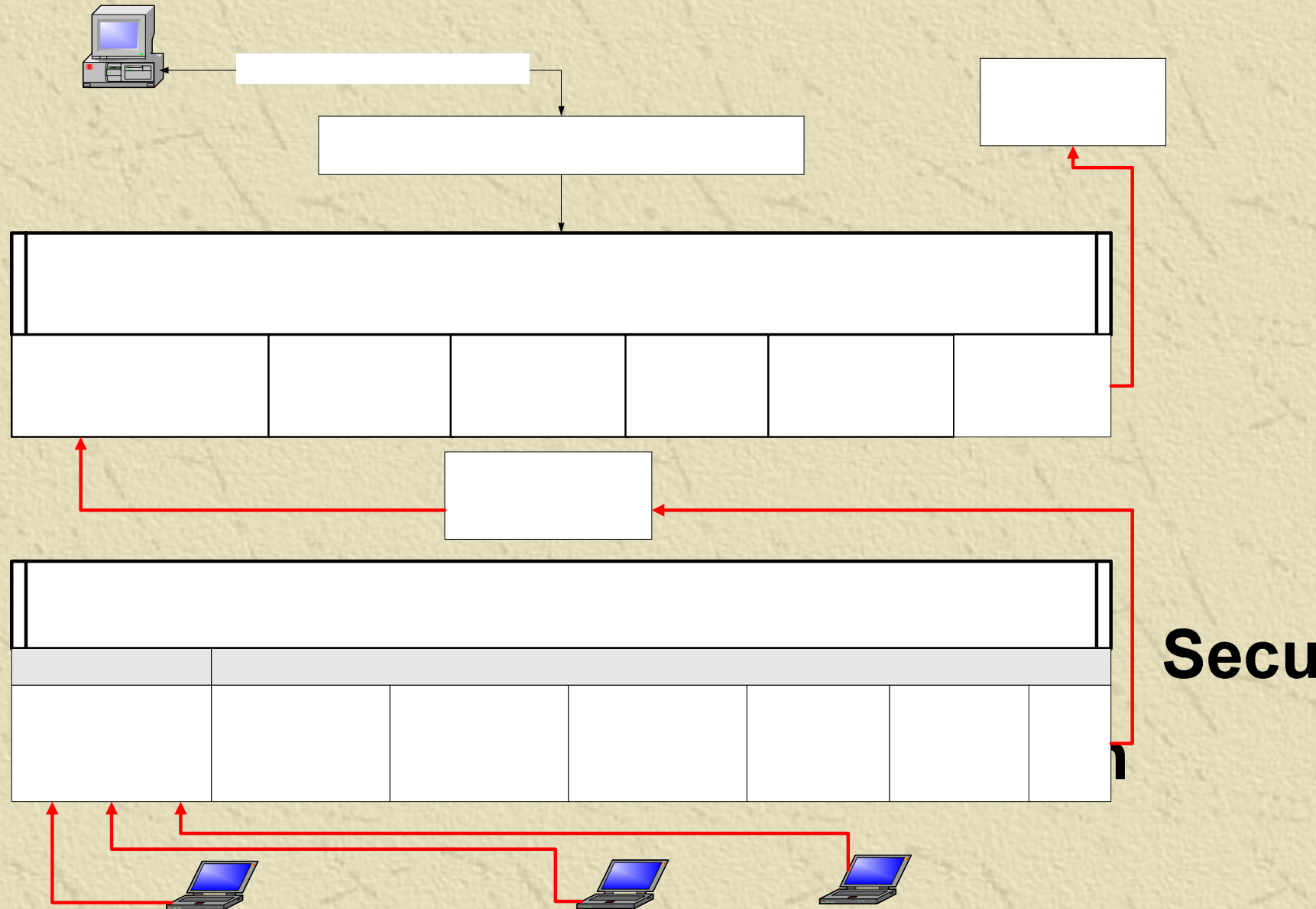
[Vaccination Listing](#)

[No Take Response Listing](#)

[Up To Date Vaccination Counts](#)

[back](#)

# Kansas Patient Vaccination System Architecture



# Kansas SPVS – 3) Export Function

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- ✠ Uploads Kansas records to CDC PVS
  - ✠ Personal identifiers removed
  - ✠ XML schema:
    - Specifications provided by CDC
    - Program written by KDHE

# KS-PVS System Development

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## ✧ System implementation:

- Start: mid-December 2002
- Offline data entry: mid-February
- Online take response: end February
- Limited online reports: beginning March
- Full online record management: May

## ✧ One HAN coordinator, 2 full time system developers, 4 part time developers

- Total about 1200 hours of work

# KS-PVS – Results (as of 5-8-2003)

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- ✧ Records imported onto online application from 12 clinics
  - ✧ 448 individual, 453 vaccination vaccination records created
- ✧ All records updated online with take response
- ✧ Weekly uploads to CDC (XML)
  - ✧ CDC implemented internal validation rules after export
  - ✧ Some state records rejected
    - State and CDC numbers mismatched

# Kansas Active Surveillance Results (n=436)

*(Preliminary data as of 4-22-2003)*

Vaccinees with at least 1 follow-up form	416 (95%)
Missed any work	17 (12%)
Visit to physician	8 (2%)
Administrative restrictions	6 (1%)
Contraindications discovered <u>after</u> vaccination:	
Immunosuppression	2 (<1%)
Heart condition	22 (5%)

# Kansas Active Surveillance Results (n=436)

*(Preliminary data as of 4-22-2003)*

<b>SYMPTOM</b>	<b>YES</b>	<b>&gt;MILD</b>
Fever	62 (14%)	9 (2%)
Local reaction	421 (96%)	183 (42%)
Swollen, tender lymph nodes	134 (31%)	43 (10%)
Others	28 (6%)	5 (1%)

# Conclusions

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✦ A state-based system was developed successfully in a short time following CDC standards

✦ Advantages:

- ✦ Quick implementation
- ✦ Flexibility, usability
- ✦ Full control over information flow
- ✦ Potential for integration into disease reporting, immunization registry systems
- ✦ Technical, professional growth is state asset

✦ Disadvantages:

- ✦ Resources for development and support
- ✦ Tight timeline for development, changing directions and standards

✦ Role of NEDSS-PHIN-CDC standards was essential for success of project

# Today's dilemma

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*Should CDC invest more resources into development of complex, centralized data systems,*

***OR***

*Should CDC maintain a central role in establishing data and communication protocols and standards, and redirect resources into state-based systems?*